

REMARKS

Claims 1-12 are in the case and presented for consideration.

Claims 1-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over either U.S. Patent 6,197,850 to Fernandez, et al. ("Fernandez") or U.S. Patent 6,360,808 to Twardowska, et al. ("Twardowska") and further in view of WO 00/73236 (or the corresponding U.S. Patent 6,972,059) to Skerdi and U.S. Patent 3,815,665 to Baur.

The Examiner states: "Each of the primary references substantially shows the invention as claimed except that their exothermic compositions contain flouride and that they do not show to form the sleeve as a single piece."

The Examiner also states: "WO '236 shows that it is desirable to use a flouride free exothermic composition for forming feeder due to environmental reason." July 11, 2006 Office Action, page 2, section 2.

The Examiner then concludes: "[i]t would have been obvious to use exothermic composition of the primary reference free of flouride..." July 11, 2006 Office Action, page 2, section 2.

The Examiner further states: "US '665 shows that it is conventional to form the exothermic sleeve as a single piece. Apparently, forming the sleeve as a single piece has an advantage over the sleeve formed from multiple pieces in that it does not require an additional step for forming the sleeve and thus the foundry operation is simpler." July 11, 2006 Office Action, pages 2-3, section 2.

The Examiner then concludes: "[i]t would have been obvious to form the sleeve of the primary references as a single piece in view of the advantages." July 11, 2006 Office Action, page 3, section 2.

The Examiner further states: "[w]ith respect to the use of plug in the other opening

as claimed, Baur also provide a cover for covering the top opening of the sleeve. The function of the cover is the same as that of claimed plug. Thus, the claimed plug is deemed to be an obvious variation of the sleeve structure of Baur.” July 11, 2006 Office Action, page 3, section 3(a).

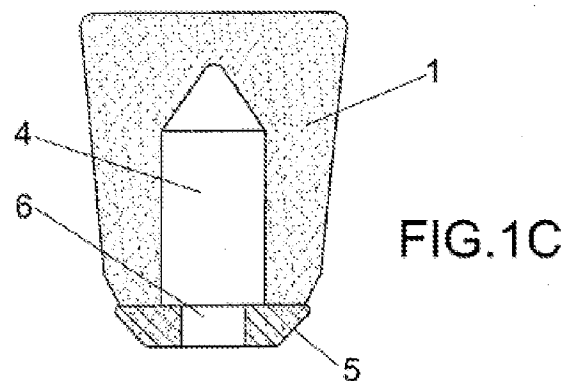
Applicant respectfully traverses the above ground of rejection.

At the outset, Applicant welcomes the opportunity to clarify for the Examiner the novel and nonobvious features of the claimed invention. The claimed invention concerns a procedure for producing an exothermic sleeve. ***In contrast to refractory and insulating sleeves***, exothermic sleeves have the advantage that they guarantee that the metal contained inside them is in a fluid state and that they can therefore compensate for the suckbacks caused during the cooling of the casting piece. With non-exothermic sleeves, part of the metal contained in their interior solidifies during the cooling of the casting piece and therefore cannot be utilized to compensate for the suckbacks. This causes the formation of deadheads, that is to say, solidified metal which is not integral with the casting piece and which must subsequently be eliminated, with the resultant cost.

The use of exothermic sleeves therefore permits a reduction in the quantity foreseen of molten metal as a supply to compensate for the suckbacks of the casting piece, which causes the deadheads formed to be smaller (mini-deadheads) and therefore the contact surface between the deadhead and the casting piece to be likewise smaller and their elimination to be cheaper.

Exothermic sleeves need an initiating agent (typically a fluoridated compound) for their exothermic reaction. The problem with these sleeves lies in that an excess of fluoride causes a degradation of the graphite nodules at the area of contact between the sleeve and the casting piece, which may cause rejection of the casting pieces obtained.

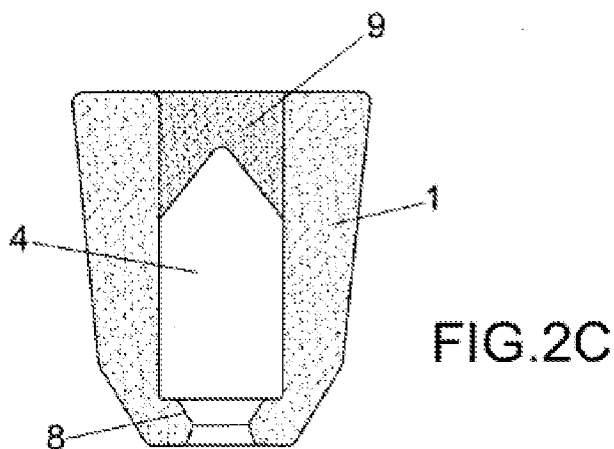
In order to solve this problem, an intermediate fluoride-free biscuit (i.e., Breaker Core) is used; this is located between the casting piece and the feed mouth of the sleeve. This biscuit has a central orifice in order to allow the passage of the molten metal contained in the sleeve into the casting piece. This orifice is usually of a small size in comparison with the internal cavity of the sleeve, as may be seen in Figure 1C (which reproduced below), so that the contact surface between the deadhead and the casting piece shall be small.



The method recited in the pending claims provides a procedure for producing exothermic sleeves, without degradation of the graphite nodules at the area of contact deadhead-part, at a reduced cost. To achieve this, the use of the fluoride-free biscuit is eliminated, and a sleeve (of a fluoride-free composition) is produced, which features a double internal chamfer (see, e.g., Fig. 2C, number 8) at the feed mouth of the sleeve in order to facilitate the elimination of the deadhead. To obtain this sleeve with the double internal chamfer (see, e.g., Fig. 2C, number 8) a mould which incorporates two males has been used; in this way, a sleeve open at both ends is produced. A plug (see, e.g., Fig. 2C, number 9) is fitted at the end of the sleeve furthest from the feed mouth; the only function of this plug being to prevent the ingress of sand or other unwanted materials into the

deadhead. Therefore, this plug may be produced from a low-cost material, for example plastic. In this way, the final cost of the sleeve is reduced even further.

For guidance, Applicant hereby attaches a graph which shows the cost of producing an exothermic sleeve with a fluoride-free biscuit compared with that of producing a sleeve in accordance with the procedure of the claimed invention.



Regarding Baur, we consider that it belongs to a field which is different from that of this invention, for the following reasons:

Baur concerns a **refractory sleeve** (col. 1, line 35). Refractory sleeves do not have the problem of excess fluoride and therefore do not require the use of the fluoride-free biscuit. That is to say, Baur does not concern the elimination of the biscuit as in our case, simply because **this type of sleeve does not use a biscuit** (emphasis). Therefore, contrary to the Examiner's assertion (in e.g., page 2, section of the Office Action), Baur would not have provided the necessary motivation for one of ordinary skill in the art to have formed an exothermic sleeve as a single piece.

The plug which may be seen in the figures of the Baur reference is different from the plug used in the claimed invention, both in terms of their function and structure. The

plug disclosed in Baur features a central orifice into which is set an element (29 or 30) which is designed to allow the entry of air into the sleeve. This device is perfectly well-known in the sector/field and is called a "Williams Core" or "Pencil Core", and is used to facilitate the commencement of the suckback. In refractory or insulating sleeves, the metal contained inside the sleeve is not completely liquid; for this reason it is necessary to "push" it downwards for the suckback to commence. This is achieved by means of the pressure exerted by the entry of atmospheric air through the "Williams Core".

In contrast, the metal contained inside the exothermic sleeve of the claimed invention is in a completely liquid state and therefore the exothermic sleeve causes the suckback with ease, with no need to use a "Williams Core".

Therefore, contrary to the Examiner's assertion (in, e.g., page 3, section 3(a) of the Office Action), those of ordinary skill in the art would not consider the claimed plug to be an obvious variation of the sleeve structure of Baur.

For the reasons discussed above, reconsideration and withdrawal of the rejection with respect to claims 1-12 is respectfully requested.

Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested. No new matter has been added.

If any issues remain, the Examiner is respectfully invited to contact the undersigned at the number below to advance the application to allowance.

Respectfully submitted,

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